Functional Area 5.5
HVAC SYSTEMS OPERATION AND MAINTENANCE

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Functional Area 5.5

HVAC SYSTEMS OPERATION AND MAINTENANCE

5.5.1 INTRODUCTION

The Contractor shall operate, maintain, repair, and replace heating, ventilating, and air conditioning (HVAC) equipment and systems. This shall include, but not be limited to, the handling of all fuels, lubricating oils, chemicals, auxiliary machinery, and boiler water treatment; attending all boiler fires to maintain steam pressure as required; and controlling the operation of chillers and cooling towers. The Contractor shall be responsible for operating, maintaining, repairing, and replacing all air distribution systems (e.g. air handling units, exhaust fans, and fan coil units), evaporative cooling equipment, vacuum systems, chilled water pumps, and hot water pumps. The Contractor shall also be responsible for installing and inspecting new equipment and systems in accordance with manufacturer recommendations and all other applicable codes and regulations. All work shall be performed by qualified personnel in accordance with applicable laws, regulations, and Government-developed annual and long range plans. Technical Exhibits provide expanded information for this Functional Area.

5.5.2 SCOPE OF SERVICES

5.5.2.1 Work Area/System Description

Systems and equipment covered under this Functional Area include, but are not limited to, the following:

- Air conditioners
- Air curtains
- Air dryers
- Air handling units
- Blowers
- Chilled water coils
- Chillers and associated components
- Cold storage facilities (walk-in and reach-in)
- Combination units (cooling/gas fired heating)
- Compressed air and compressed gas equipment
- Compressors (reciprocating or hermetic)
- Condensate pumps and tanks
- Condensers
- Controls (electrical, mechanical, and pneumatic)

- Coolers
- Cooling towers and associated components
- Evaporative condensers (open or closed-tube)
- Evaporators
- Exhaust fans
- Expansion tanks
- Fan coil units
- Filters (air and coolant)
- Guards, casings, hangers, supports, platforms, and mounting belts
- Heat recovery equipment
- Heaters
- Heating coils
- Hot water boilers and associated components
- Humidifiers
- Induction units
- Instruments
- Mechanical ventilation and exhaust equipment
- Mixing boxes
- Motors and drive assemblies
- Oil tanks
- Paint spray exhaust equipment
- Pumps
- Sand/grit blast and dust collection equipment
- Steam boilers and associated components
- Thermostats
- Vacuum equipment
- Wiring for HVAC systems

Although the Contractor shall be responsible for the occasional repair of air compressors, pneumatic temperature controls, and exhaust hood systems, the Contractor shall not be responsible for preventive maintenance or periodic cleaning of these systems since separate service contracts are currently in place to handle such tasks.

5.5.2.2 Work Management and Control

5.5.2.2.1 Compliance. While performing any work on HVAC systems, the Contractor shall comply with all applicable manufacturer recommendations and ASHRAE, OSHA, EPA, NFPA, 92 CFR, 49 CFR, ANSI, Uniform Plumbing, and National Electric codes, regulations, and standards.

5.5.2.2.2 Reporting Requirements. The Contractor shall prepare, submit, and maintain all records and reports as specified herein and in accordance with Contract Data Requirement Lists (CDRLs) in Technical Exhibit 5.5-001.

5.5.2.2.3 Publications and Forms. Specific publications and forms required for the accomplishment of work described in this Functional Area are listed in Section C-6.

5.5.2.2.4 Conservation of Energy. The Contractor shall observe and test the efficiency of the operating equipment for the conservation of energy. The Contractor shall maintain HVAC system outputs as required by ASHRAE for each type of equipment. The Contractor shall ensure that minimum air changes are effected in accordance with ASHRAE requirements and based on comparisons of the temperatures of the outside air, the return air, and the mixed air.

5.5.2.2.5 Equipment Not in Use. The Contractor shall maintain all boilers and chillers that are not currently in use in a ready condition. If any boiler or chiller cannot be placed on line within eight hours, notification, including the probable cause, shall be given to the COR.

5.5.2.2.6 Emergency Notification. Operational emergencies, such as ruptured mains, loss of boilers, and loss of power, which reduce the steam rate by 15% or boiler pressure by 20% or more for a period extending beyond 30 minutes, shall be reported within 30 minutes of occurrence to the COR, together with identification of the probable cause and the estimated time required before full pressure and steam rate can be restored.

5.5.2.2.7 Noted Defects. The Contractor shall correct defects noted while maintenance is performed, but shall ensure minimum downtime when more complex work is required.

5.5.2.2.8 Use of Lubricants. The Contractor shall use types, grades, or weights of lubricants that are generally acceptable within the trade to perform all lubrication of equipment unless special types, grades, or weights are specified.

5.5.2.2.9 Chlorofluorocarbons. The Contractor shall control all Chlorofluorocarbons (CFCs) and prevent the unintentional release of CFCs to the atmosphere. CFC exchange shall only be accomplished by personnel certified in type III certification to handle CFC materials. CFC control shall be in accordance with Environmental Protection Agency (EPA) regulations. Additional instructions are shown in Technical Exhibit 5.5-002.

5.5.2.2.10 Marking. The Contractor shall mark and color code all new or unmarked exposed piping or conduit for chilled water, heating water, domestic water, oil, electric, natural gas, refrigerant, and all related HVAC systems. Any new marking or renewal of obscure/faded markings shall conform to Installation policies.

5.5.2.2.11 Thermostat Setting. The Contractor shall set the thermostats in non-exempt buildings at no lower than 78°F for the cooling season, and no higher than 68°F for the heating season, unless otherwise directed by the COR.

5.5.3 SCHEDULED TASKS

The Contractor shall perform the tasks described below on a recurring or scheduled basis and record the work under approved Standing Operating Orders (SOOs). Preventive maintenance and other scheduled task frequencies that apply to this Functional Area are presented in Technical Exhibit 5.5-003. Partial lists of installed serviceable equipment located at Fort Lee and its properties are provided in Technical Exhibits 5-001, 5-002, and 5-003. If a requirement for further repair work on any equipment is identified during the performance of scheduled tasks, the Contractor may be required to accomplish such work upon receipt of an approved Service Order (SO) or Individual Job Order (IJO).

5.5.3.1 MEDDAC Systems

5.5.3.1.1 Daily Inspection. The Contractor shall conduct a daily visual inspection of all major HVAC systems (i.e., steam boilers, chillers, and cooling towers) at the MEDDAC Clinic (Buildings 8130 and 8131). The inspection shall include, but not be limited to, checking safety devices, testing boiler tube blowdowns, checking pressure gauges, checking alarm panels, checking thermostats, testing relief valves, checking for leaks, cracks, or unusual noises, checking for properly lit indicator and mode lights, checking humidity levels, and checking general operation. Inspections shall be recorded in the daily logbook.

5.5.3.1.2 Water Testing. Three times a week, the Contractor shall conduct water testing of steam boilers in Building 8131, to include testing of hydrate alkalinity, phosphate, specific conductance, total dissolved solids (TDS), silica, and make-up and feedwater hardness. If deficiencies are discovered, the Contractor shall take appropriate corrective actions.

5.5.3.2 Boiler Operation

The Contractor shall maintain and operate the two high-pressure boilers located at Building 8131 on a daily basis. The Contractor must be able to respond to any operational problem within 15 minutes of its discovery, 24 hours a day, 7 days a week.

5.5.3.3 Daily HVAC System Checks

On a daily basis, the Contractor shall complete the items listed on the HVAC System Daily Checklist provided in Technical Exhibit 5.5-006. The Contractor shall maintain a logbook with daily findings, including boiler condition (idle or operating), whether or not a Service Order had to be called in to the Service Order Desk, and if so, the reason for submitting the Service Order.

5.5.3.4 Water Testing and Treatment

The Contractor shall conduct water tests of HVAC equipment in the buildings listed in Technical Exhibit 5.5-005. If tests show abnormalities, the Contractor shall take corrective action. For all systems, the chemical feed rate and bleed-off shall be adjusted as necessary, a record of chemicals used (including amounts), test results, and an analysis of findings shall be kept up to date, and chemical feed equipment shall be

maintained. The Government will furnish two water testing laboratories in Building 6220 where samples may be analyzed. The following tests shall be performed:

5.5.3.4.1 Cooling Towers. The following work shall be performed on cooling towers at a frequency based on their size. Cooling towers less than 50 tons shall be tested, inspected, cleaned, and maintained once per week; between 50 and 100 tons, two to three per week; and over 100 tons, once per day.

5.5.3.4.1.1 Testing. The following parameters shall be tested and analyzed on cooling towers in operation: conductivity (no more than 1500), pH, M-alkalinity, Ca-hardness, inhibitors (HEDP=3 ppm), tolyltriazole (2-3 ppm), polylyacrylate polymer (5 ppm), sodium molydbate dihydrate (6-7.5 ppm),Halogen donors, COC (6 to 7), and silica (less than 150 ppm). The Contractor shall also perform the following tests: Biological Activity Reaction test, Slime-Forming Bacteria test, Total Aerobic Bacteria test, Blue-Green Algae test, and a test of the practical scaling index (PSI). The Contractor shall use generic chemicals in the treatment of cooling towers, and shall mix all chemicals in the mixing room at Building 6220.

5.5.3.4.1.2 Inspection. In conjunction with all cooling tower testing, the Contractor shall: inspect all cooling tower equipment, including fans and circulating pumps; clean cooling towers (including the tops); and maintain all chemical pumps, instrumentation, and levels in the chemical tanks.

5.5.3.4.2 Condensate Returns. Condensate samples shall be taken once per week for boilers in operation. The Contractor shall test pH (at least 7.5) and conductivity. If conductivity is greater than 20 to 25 micromhos, the sample shall be tested for calcium hardness. Iron shall be tested at condensate returns quarterly. Only a generic neutralizing amine shall be used.

5.5.3.4.3 Steam Boilers. The following parameters shall be tested and analyzed on steam boilers: hydrate alkalinity, phosphate, specific conductance (conductivity), total dissolved solids (TDS), silica, make-up and feedwater hardness, causticity (23 to 200 ppm), phosphate (30 to 60 ppm), sulfite (20 to 40 ppm) on boilers with deaerators, and polymers (2 to 5 ppm). Hydrate alkalinity shall be tested by barium chloride precipitation or determined by the (2p)-M calculation form conventional alkalinity. The Contractor shall also test deaerators to ensure that oxygen is less than seven parts per billion. Unless otherwise stated (e.g., Building 8131), all steam boilers in operation shall be tested and treated weekly. All chemicals used in boilers shall be generic.

5.5.3.4.4 Hot Water Boilers. The following parameters shall be tested and analyzed monthly, or more frequently as needed, on hot water boilers in operation: corrosion level (nitrite = 600 to 1200 ppm) and pH (8.5 to 9.5). Also on a monthly basis, the Contractor shall perform the following tests: Biological Activity Reaction test, Iron-Related Bacteria test, Sulfate-Reducing Bacteria test, Denitrifying Bacteria test and Nitrifying Bacteria test. Hot water treatment shall be a mix of sodium nitrite, borax, tolytriazole, and sodium carbonate. A biological test of hot water boilers shall be performed bi-annually. All chemicals used in boilers shall be generic.

5.5.3.4.5 Water Softeners. On a weekly basis, the Contractor shall check all boilers that have a zeolit water softener for hardness using the total hardness test. When excess hardness is present in the softened water, the Contractor shall regenerate the

softener. Hardness shall not exceed 2 PPM at any time. As part of the weekly check, the Contractor shall add sodium chloride to the brine tank as needed.

5.5.3.5 Air Conditioning - Heat and Heat - Air Conditioning Changeover

The Contractor shall maintain a report of all work performed for changeover services, including date, hours expended, equipment name/number, and facility name/number, and shall indicate any needed repairs submitted via Service Order.

5.5.3.5.1 Heat to Air Conditioning. The Contractor shall begin start-up of all applicable cooling systems and shut-down of all applicable heating systems, historically on 1 April, and complete the start-up within 15 days. Climatic variations may require the COR to direct changeover of seasonal equipment at dates earlier, or later, than those specified. During changeover, the Contractor shall take corrective action via Service Order or Individual Job Order if any operational deficiencies are identified. Start-up and shut-down services are listed in Technical Exhibit 5.5-004.

5.5.3.5.1.1 Shut-down of Hot Water Boilers. At the end of the operating season, the Contractor shall add dispersant several days prior to shut-down, drain the system, flush the system, and lay the system up with treated water.

5.5.3.5.2 Air Conditioning to Heat. The Contractor shall begin shut-down of all applicable cooling systems and start-up of all applicable heating systems, historically on 1 October, and complete the changeover within 15 days. Climatic variations may require the COR to direct changeover of seasonal equipment at dates earlier, or later, than those specified. During changeover, the Contractor shall take corrective action via Service Order or Individual Job Order if any operational deficiencies are identified. Start-up and shut-down services are listed in Technical Exhibit 5.5-004.

5.5.3.5.3 Additional Tasks. In addition to the tasks on the start-up and shut-down checklists in Technical Exhibit 5.5-004, the Contractor shall: switch over valves from air conditioning to heating and vice versa as specified; check EMCS controls; put on computer controls; run systems through a complete cycle; activate thermostats; verify operation of all safety and operating controls; check systems for water and refrigerant leaks; check pressure gauges, dampers, and linkages; and check cooling/heating output and overall system operation.

5.5.3.6 Cooling Plants and Systems

The Contractor shall operate and maintain cooling systems and related auxiliary equipment, including but not limited to, chillers, cooling towers, air conditioning units, refrigeration systems, pumps, compressors, and motors. All equipment shall be maintained to meet operational requirements except when off-line for maintenance or secured for energy conservation. All scheduled maintenance shall include a visual inspection of all components to ensure proper operation and to check for leaks or other deficiencies. The Contractor shall take corrective action as necessary. The Contractor shall also ensure control systems operate and function in such a manner so as to maintain the specified output of the mechanical system it controls. The Contractor shall maintain logbooks and a building checklist following completion of all maintenance activities.

5.5.3.6.1 Semi-Annual Maintenance. The Contractor shall perform the following maintenance on a semi-annual basis on all cooling systems. Those tasks performed during the cooling season while the systems are in operation shall be external in

nature. Those tasks performed during the heating season while the systems are shutdown shall be internal in nature.

5.5.3.6.1.1 Cooling Towers. Maintenance tasks shall include, but are not limited to: disassembling, cleaning, reassembling float and ball-cock valves; washing down the interior; cleaning perforated head pans and spray nozzles; draining and flushing tower pans, pipelines and pumps; inspecting tower fans and drives; checking and lubricating pump motor bearings; checking gear boxes; checking power sump heaters; painting all metal parts subject to alternate wetting and drying; and calibrating the system.

5.5.3.6.1.2 Chillers. Maintenance tasks shall include, but are not limited to: checking oil levels, temperature controls, thermostats, pressure gauges, and electrical connections; checking for refrigerant leaks, changing oil; and cleaning condensers and rod tubes. The Contractor shall also lube, repack bearings, check alignment, check operation, check amperage, clean and overhaul chiller pumps, and calibrate the system.

5.5.3.6.1.3 Direct Expansion Cooling/Dehumidifiers. Maintenance tasks shall include, but are not limited to: cleaning coils, changing filters, checking for refrigerant leaks, checking expansion valves, cleaning drain/condensate pans, and calibrating the system.

5.5.3.6.1.4 Air Conditioning Units/Air Cooled Condensers. Maintenance tasks shall include, but are not limited to: cleaning, inspecting and covering air cooled condensers; cleaning coils; cleaning and checking fan blades; inspecting and lubricating fan bearings; replacing or adjusting loose fan belts; and calibrating the system.

a. Air Filters. Air filters shall be changed every six months. In conjunction with this task, the Contractor shall clean the equipment, identify other needed repairs, properly dispose of used filters, and maintain a record of where and when filters were changed.

5.5.3.6.1.5 Refrigeration Equipment. Maintenance tasks shall include, but are not limited to: checking vessel connections, relief valves, coils, and lines for leaks; cleaning coils, drain pans, drain lines, fan blades, and cabinets; checking refrigerant oil, dryers, sight glasses, and charge; and calibrating the system.

5.5.3.6.2 Annual Maintenance.

5.5.3.6.2.1 Closed-loop A/C Systems. The Contractor shall check anti-freeze in all closed-loop air conditioning systems on an annual basis. As required, the Contractor shall add anti-freeze to replenish safe levels in the systems, prevent freeze-up, and bring the freezing point to -12°F. There are approximately 65 closed-loop water systems on Fort Lee.

5.5.3.6.2.2 Chillers. The Contractor shall change oil filters on all chillers on an annual basis in accordance with manufacturer maintenance manuals.

5.5.3.7 Heating Plants and Systems

The Contractor shall operate and maintain heating systems and related auxiliary equipment, including electric boilers, oil boilers, gas boilers, steam boilers, hot water boilers, boiler

feed pumps, condensate return pumps, air compressors, and related equipment. All equipment shall be maintained to meet operational requirements except when off-line for maintenance or secured for energy conservation. All scheduled maintenance shall include a visual inspection of all components to ensure proper operation and to check for leaks or other deficiencies. The Contractor shall take corrective action as necessary. The Contractor shall also ensure control systems operate and function in such a manner so as to maintain the specified output of the mechanical system it controls. The Contractor shall maintain logbooks and a building checklist following completion of all maintenance activities.

5.5.3.7.1 Periodic Checks on Steam Boiler and Hot Water Boiler Systems. The Contractor shall perform the following tasks weekly on steam boiler systems, and monthly on hot water boiler systems:

a. Observe and control condition of fire to carry highest possible carbon dioxide with the lowest possible stack temperature without smoke pollution to the atmosphere.

b. Ensure boiler water levels are maintained at rated levels.

c. Change and clean burners, cups, and strainers in boilers to remove sludge and carbon build up.

d. Ensure flame failure controls and low water cut-outs are in safe operating condition.

e. Inspect dampers of operating boilers to ensure opening and closing.

f. Inspect electrical equipment for cleanliness, vibration, and noise levels in accordance with TM 5-650.

g. Check soot blowers for proper operation.

h. Perform blow-down of the water columns and surface drums for a minimum of 15 seconds, depending on conditions shown by the chemical analysis of the boiler water. Water walls and cascades shall be blown down. Continuous blow-down shall be accomplished to control solid levels in all boilers.

i. Perform readings such as pressure, temperature, and volume. Other readings shall be taken by the Contractor at the direction of the COR

5.5.3.7.2 Mid-Season Maintenance to Heating Systems. The Contractor shall perform the following tasks on heating systems during mid-season:

a. Ensure boiler water levels are maintained at rated levels.

b. Change and clean burners, cups, and strainer in boilers to remove sludge and carbon build up.

c. Blow-down boilers and water columns.

d. Ensure flame failure controls and low water cut-outs are in safe operating condition.

e. Inspect electrical equipment for cleanliness, vibration, and noise levels in accordance with TM 5-650.

f. Inspect dampers of operating boilers to ensure opening and closing.

g. Inspect boilers for steam and water leaks.

5.5.3.7.3 Semi-annual Heating System Maintenance. The Contractor shall inspect and test safety controls, burners, pumps, and other related equipment on a semi-annual basis.

5.5.3.7.4 Annual Maintenance to Heating Systems. The Contractor shall perform the following tasks on heating systems on an annual basis:

5.5.3.7.4.1 Annual Overhaul and Class “B” Boiler Inspection. The Contractor shall perform the following internal inspection for all boilers:

a. Remove boiler from service.

b. Cool down boiler.

c. Open fire side.

d. Clean tubes, fire box, and tube sheets.

e. Remove manhole covers.

f. Clean waterside.

g. Dismantle low water cutoffs and clean.

h. Remove piping to operating and safety controls.

i. Remove plugs from cross connections.

j. Place boiler back in operation.

k. Check operation.

l. Check safety and operating controls.

m. Perform a hydrostatic test.

The Contractor shall then overhaul boiler components as necessary so that the boiler meets start-up specifications. Overhaul shall be performed via Service Order or Individual Job Order, upon receipt of a valid work document.

5.5.3.7.4.2 Class “C” Boiler Inspection. The Contractor shall inspect the following components of all boilers:

a. Condition of boiler seams

b. Tube ends and pipe connections

c. Boiler settings and linings

d. Baffles

e. Boiler supports

f. Safety valves and pressure gauges

g. Water columns

h. Gauge glasses

i. Blow-off pipes, blow-off valves, and blow-off cocks

j. Feed pipes, fee water regulators, and feed water control valves

k. Dampers

l. Burner air switches

m. Manhole gaskets

n. Steam stop valves and steam drum vent valves

The Contractor shall repair or replace worn or otherwise defective components upon receipt of an approved Service Order or Individual Job Order.

5.5.3.7.4.3 Other Annual Maintenance Tasks. The Contractor shall also:

a. Observe and control condition of fire to carry highest possible carbon dioxide with the lowest possible stack temperature without smoke pollution to the atmosphere.

b. Inspect boilers both internally and externally for cracks, deformities, and corrosion.

c. Clean the interior of the boiler (shell, drums, and tubes) to remove mud, loose scale, and similar deposits.

d. Inspect the boilers interior for grease or oil and remove to improve heat transfer and operation efficiency.

e. Inspect staybolts for corrosion and leaks; shell and tubes for corrosion and scale; tube ends for corrosion and leakage; boiler-feed piping for weakness; baffles; safety connections for leaks, chattering, or simmering; uptake damper; and escape pipe.

f. Inspect water column, feed water regulator, drain, water alarms high and low and gauge glass to ensure water levels are maintained.

g. Inspect connect piping between boiler and water column for corrosion and strains.

h. Inspect boiler pressure gauge for operation within boiler limits and blow-off valves for presence of foreign matter.

i. Inspect for strains due to settling in steam piping, boiler feed-eater piping, and any exterior cracks or openings.

j. Inspect for eroded or spalled brickwork.

k. Clean and check combustion for shifting walls.

l. Vacuum soot blowers.

m. Inspect control systems following manufacturer’s recommendations.

n. Clean oil burner strainers; disassemble, clean, and inspect all parts of burners for signs of overheating and burning away of metal.

o. Inspect all oil valves for wear and carbon build up. Clean burner nozzle openings to remove carbon build up.

p. Inspect oil burner hose and flexible connections for cracks and deterioration. Inspect pumps and heater for mechanical and electrical and shut off or disconnect the draft gauge operation in accordance with TM 5-650.

q. Clean and remove dirt and dust from forced-draft and induced-draft fans. Apply corrosion protection and inspect motors and bearings for overheating.

r. Open, inspect, and clean each boiler both on water side and fire side.

s. Prepare high pressure steam boilers in Building 8131 for additional boiler inspection in accordance with AR 420-49, Paragraphs 2-12 and 2-13. (The inspection will be performed by a qualified inspection firm under a separate contract with the Government. The COR will provide a schedule to the Contractor for the inspections and will also order the inspection services.)

t. Perform maintenance in accordance with manufacturer's recommendations on all combustion controls to include steam flow recorders, pressure-control switches, oxygen analyzers, fuel flow meters, gas/oil metering valves, draft controllers, induced draft fans, forced draft fans, and gas/oil burning equipment.

5.5.3.8 Humidifiers

Semi-annually, the Contractor shall inspect and clean humidifier strainers, drains, and drain pans; clean float assembly, spray nozzles, and exterior surfaces; and inspect unit operating conditions, electrical connections, relays, contactors, and operating and safety controls.

5.5.3.9 Air Handling Units, Fan Coil Units, Unit Heaters, and Unit Ventilators

On all air handling units, fan coil units, unit heaters, and unit ventilators, the Contractor shall semi-annually: check motor amperage; clean coils; check electrical connections; check for vibration; check motor mounts and supports; and check belts.

5.5.3.10 Exhaust Fans and Ventilators

On all exhaust fans and ventilators, the Contractor shall semi-annually check motor amperage; check electrical connections; check for vibration; check motor mounts and supports; and check belts.

5.5.3.11 Heat Exchangers

The Contractor shall conduct semi-annual preventive maintenance on heat exchangers, including inspecting for leaks; cleaning strainers and exterior surfaces; and inspecting operating safety devices, temperature controls, steam traps, and hand valves.

5.5.3.12 Paint Booth

The Contractor shall inspect and maintain all safety controls, operating controls, and heat and ventilation equipment on the paint booth on a quarterly basis.

5.5.4 UNSCHEDULED TASKS

The Contractor shall perform the tasks described below when initiated through either a Service Order (SO) or an approved Individual Job Order (IJO).

5.5.4.1 Unscheduled Repair

The Contractor shall perform unscheduled repair on systems including, but not limited to, cooling systems, heating systems, air conditioning units, air compressors, vacuum systems, mechanical ventilation equipment, air distribution systems, and automatic temperature control systems. The Contractor shall inspect, test, clean, adjust, calibrate, and repair or replace all parts, or components, necessary to restore the equipment, or system to a condition to perform the function for which it was designed.

5.5.4.1.1 Cooling Equipment. The Contractor shall adjust, modify, replace, and repair all cooling systems and cooling towers, to include, but not limited to, motors, fans, drains, valves, and control devices. The Contractor shall locate and remove piping obstructions from fan coil units, air handler units with coils, and other cooling equipment. Trade practices, methods, and equipment shall be used.

5.5.4.1.2 Heating Equipment. The Contractor shall maintain and repair all steam-fitting, low and medium pressure steam, and high-temperature, high-pressure hot water heating lines for heating and processing boilers, converters, pumps and associated controls, piping, and equipment. The Contractor shall maintain and repair all steam, hot water, gas fired, oil fired, electric generated heating equipment, and components.

5.5.4.1.3 Peak Shaving Plant Equipment. The Contractor shall maintain and repair all components of the Peak Shaving Plant to include storage tanks, piping, valves, fittings, safety valves, mixing valves, air compressors, heaters, boilers, burners, pumps, all electrical controls and relays, meters, electric motors, wiring starters, electrical safety devices and interlocks in accordance with TM 5-551K and manufacturer maintenance manuals. The COR will contract with the original manufacturer to adjust and calibrate controls, mixers, specific gravity controls, meters, electrical and electronic controls and devices biannually or when notified in writing by the Contractor based upon usage and accuracy of calibration.

5.5.4.2 New Equipment Installation and Inspection

The Contractor shall install new HVAC equipment and systems upon receipt of a valid work document. The Contractor shall inspect and evaluate new equipment for compliance with the manufacturer's specifications and shall notify the COR of all deficiencies noted during this inspection.

5.5.4.3 Equipment Modifications

The Contractor shall modify HVAC equipment and systems upon receipt of a valid work document and shall evaluate the modification of the equipment for compliance with the manufacturer’s specifications.

5.5.4.4 Equipment and System Removal

The Contractor shall remove HVAC equipment and systems upon receipt of a valid work document.

5.5.4.5 Reduced Power Response

When required for reduced Electrical Distribution System (EDS) loading, the Contractor shall shut down non-critical air conditioning systems during reduced EDS loading within one hour after notification from the COR.

5.5.4.6 Unscheduled Air Conditioning/Heat Changeover

The Contractor shall change HVAC systems from air conditioning to heat or heat to air conditioning due to fluctuations in temperature or as directed by the COR.

5.5.4.7 Freezing Weather Maintenance

The Contractor shall perform maintenance and checks during freezing weather conditions to prevent damage to HVAC equipment. All work shall be done in accordance with the freeze-up plan submitted as part of the Service Plan.

5.5.4.7.1 Boiler and Piping. The Contractor shall drain and blow out all idle equipment; check service water lines for possible freezing; check that insulation is not damaged; check tracing around control lines and transmitter boxes; and check stream traps for proper operation.

5.5.4.7.2 Compressor Air Systems. The Contractor shall drain air tanks; inspect air driers, aftercoolers, and intercoolers; and drain, blow out, and flush with glycol all idle compressor jackets.

5.5.4.7.3 Air Conditioning and Refrigeration Systems. The Contractor shall drain, blow out, and flush all seasonal equipment, condenser lines, tubing, and piping. The Contractor shall inspect outside dampers and cut back cooling tower fan speeds.

5.5.4.7.4 Pressure Vessel Vents. The Contractor shall drain loops and bends and correct low spots in long runs. The Contractor shall protect vessel vents from ice or snow accumulation.

5.5.4.7.5 Relief Valves. The Contractor shall protect relief valves from snow or ice accumulation; clear relief valve body drains; protect valve discs from freezing shut; and relocate relief valves to heated areas wherever possible.

5.5.4.7.6 Mechanical Equipment. The Contractor shall drain all idle pumps and compressors. The Contractor shall ensure that jackets are vented; provide proper lubrication for cold weather protection; provide heated enclosures around operating equipment wherever possible; and install no-flow switches and alarms in cooling water lines. The Contractor shall add antifreeze to chilled water lines and idle pumps as needed to prevent freezing while systems are shut-down.

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